

What is claimed is:

1. A communication semiconductor integrated circuit device comprising:

a gain variable amplification circuit for amplifying I-signals of in-phase component and Q-signals of quadrature component with respect to fundamental wave; and

a signal synthesis circuit for synthesizing the amplified I-signals and Q-signals and local oscillation signals to carry out modulation and frequency conversion,

said communication semiconductor integrated circuit device being capable of transmission by two or more different modulation methods,

wherein a low-pass filter of second or higher order is provided between said gain variable amplification circuit and said signal synthesis circuit.

2. The communication semiconductor integrated circuit device according to Claim 1,

wherein a second gain variable amplification circuit is provided in the stage subsequent to said signal synthesis circuit.

3. The communication semiconductor integrated circuit device according to Claim 1,

wherein a second gain variable amplification circuit and an amplification circuit having a limiter function are provided in the stage subsequent to said signal synthesis circuit, and

wherein modulated transmission signals having information in the phase component and in the amplitude component are amplified through said second gain variable amplification circuit, and modulated transmission signals having information in the phase component and not having information in the amplitude component are amplified through said amplification circuit having a limiter function.

4. The communication semiconductor integrated circuit device according to Claim 1,

wherein an amplification circuit of fixed gain is provided in the stage subsequent to said signal synthesis circuit.

5. The communication semiconductor integrated circuit device according to Claim 1,

wherein said low-pass filter comprises a plurality of capacitive elements and a switch element connected in series with any of a plurality of the capacitive elements, and the cut-off frequency of the low-pass filter can be changed by turning on/off the switch element.

6. A communication semiconductor integrated circuit device comprising:

a gain variable amplification circuit for amplifying I-signals and Q-signals; and

a signal synthesis circuit for synthesizing the amplified I-signals and Q-signals and local oscillation signals to carry out modulation and frequency conversion,

said communication semiconductor integrated circuit device being capable of transmission by two or more different modulation methods,

wherein a low-pass filter is provided between said gain variable amplification circuit and said signal synthesis circuit, and a second gain variable amplification circuit is provided in the stage subsequent to said signal synthesis circuit.

7. The communication semiconductor integrated

circuit device according to Claim 6,

wherein a second gain variable amplification circuit and an amplification circuit having a limiter function are provided in the stage subsequent to said signal synthesis circuit, and

wherein modulated transmission signals having information in the phase component and in the amplitude component are amplified through said second gain variable amplification circuit, and modulated transmission signals having information in the phase component and not having information in the amplitude component are amplified through said amplification circuit having a limiter function.

8. A wireless communication system comprising:

a communication semiconductor integrated circuit device according to Claim 1;

a signal processing semiconductor integrated circuit which generates said I-signals and Q-signals supplied to the communication semiconductor integrated circuit device; and

a power amplification circuit which amplifies the power of signals outputted from said communication semiconductor integrated circuit

device,

wherein a signal for controlling the gain of said gain variable amplification circuit is supplied from said signal processing semiconductor integrated circuit to said communication semiconductor integrated circuit device.

9. A wireless communication system comprising:

a communication semiconductor integrated circuit device according to Claim 2;

a signal processing semiconductor integrated circuit which generates said I-signals and Q-signals supplied to the communication semiconductor integrated circuit device; and

a power amplification circuit which amplifies the power of signals outputted from said communication semiconductor integrated circuit device,

wherein a signal for controlling the gain of said gain variable amplification circuit and a signal for controlling the gain of said second gain variable amplification circuit are supplied from said signal processing semiconductor integrated circuit to said communication semiconductor integrated circuit device.

10. The wireless communication system according to Claim 8,

wherein the gain of said power amplification circuit is variable, and a signal for controlling the gain of the power amplification circuit is supplied from said signal processing semiconductor integrated circuit to said power amplification circuit.

11. The wireless communication system according to Claim 8,

wherein a band-pass filter is provided between said signal processing semiconductor integrated circuit and said power amplification circuit.